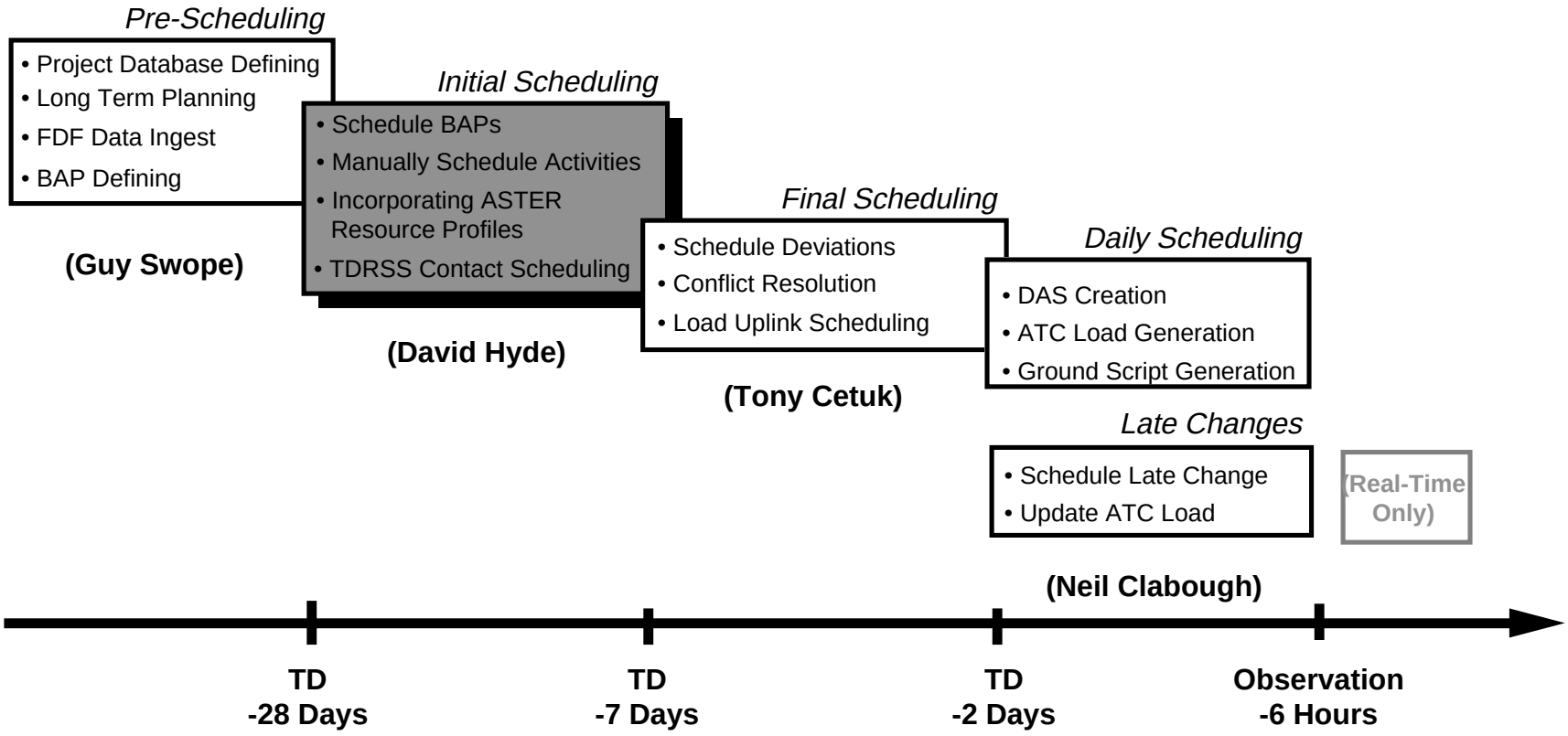
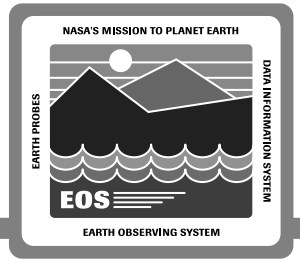
Initial Scheduling



Initial Scheduling Overview



Covers from 28 days to 7 days prior to target day

Initial scheduling includes:

- **Adding Instrument activities to mission schedule**
- **Scheduling Baseline Activity Profiles (BAP's)**
- **Batch scheduling**
- **Generating TDRSS contact requests**

Software allows BAP's or batch scheduling on all resources

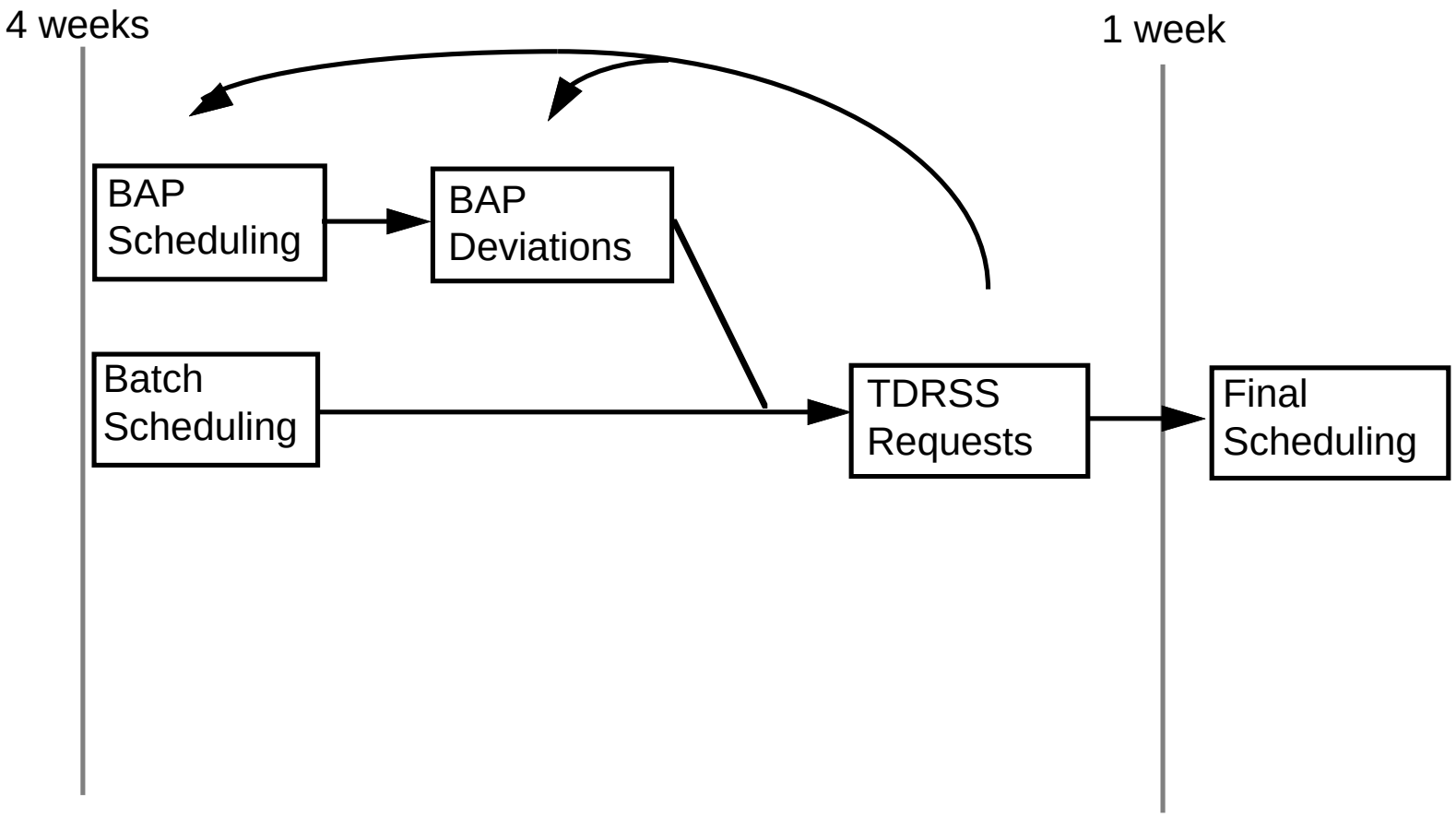
- **CERES, MODIS & MOPITT use BAP's**
- **ASTER use batch for both Resource Profiles and Activities**
- **MISR uses both BAP's and batch mode**

Oversubscription and Conflicts flagged

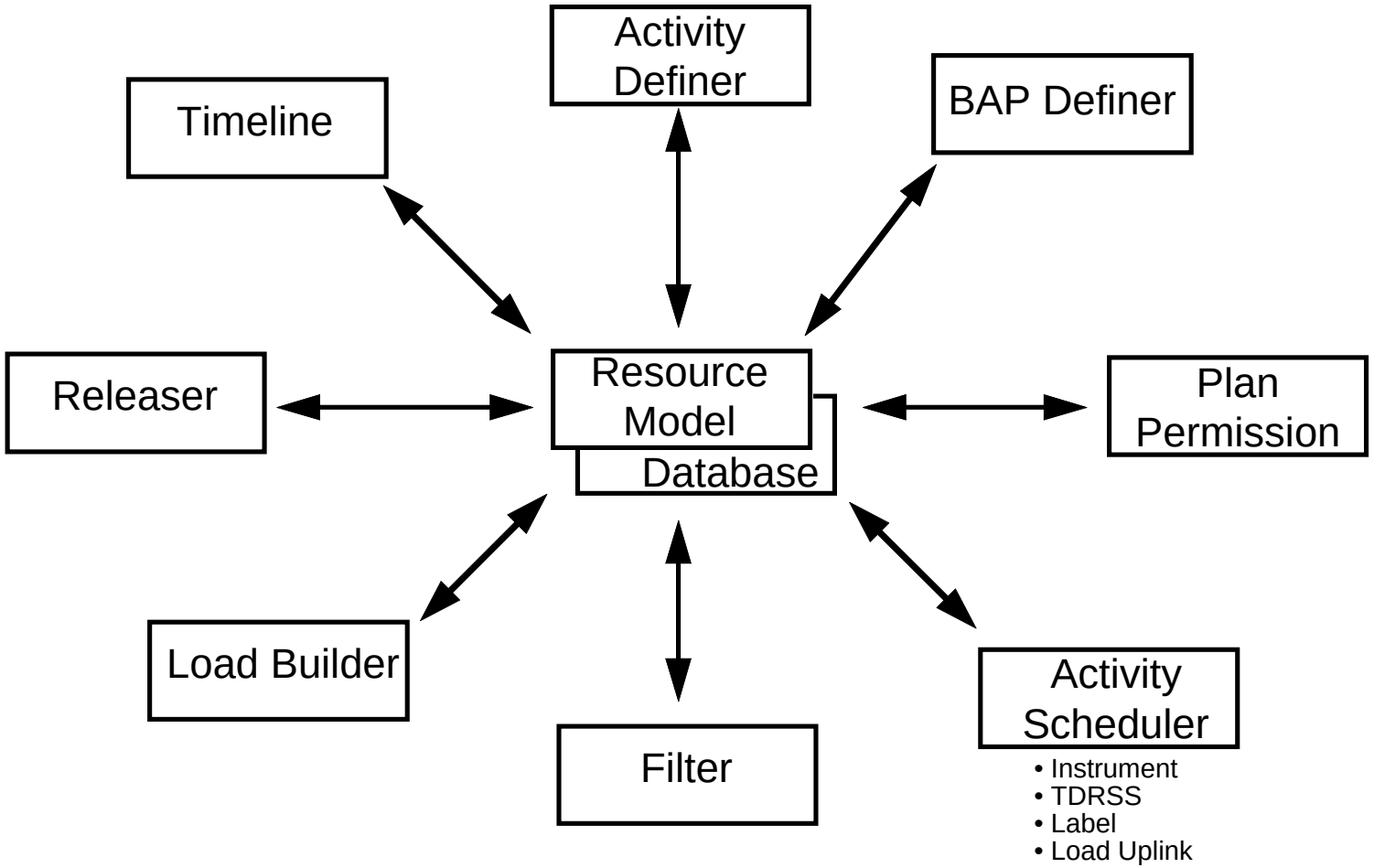
- **Conflicts need not be resolved until Final Scheduling**
- **Allows for natural refinement of schedule over time**

Mission schedule viewed using timeline tool from EOC or IST

Initial Scheduling Process



Scheduling Tools

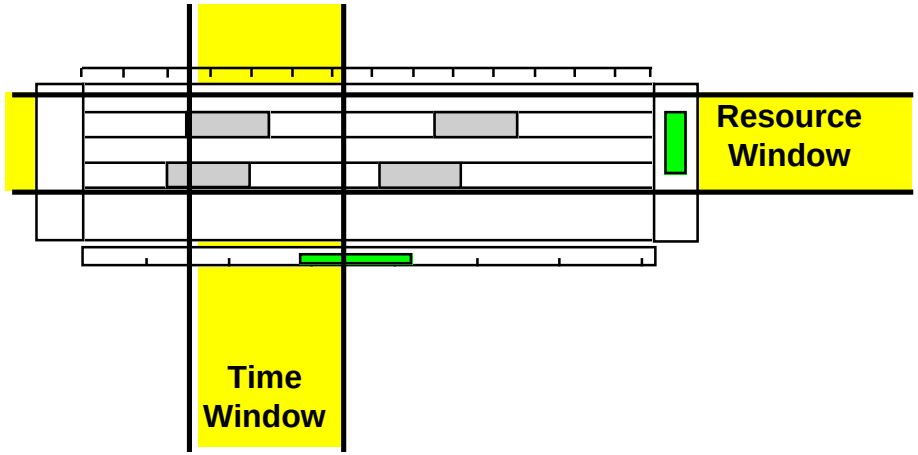


Plan Permission Tool

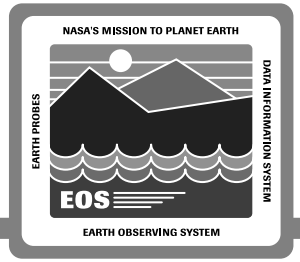
Plan Permission Tool provides locking mechanism

User specifies resource and time interval

Allows multiple users updating mission schedule without risk of conflict

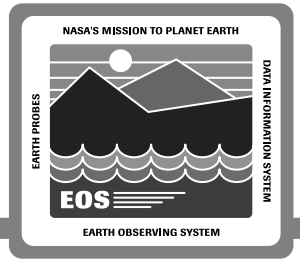


Plan Permission Object Model



See following page.

Timeline Description



Shows resource states over time

Timeline display determined by configuration files

- **Users can display timeline with single instrument or multiple instruments**
- **New displays can be produced easily**

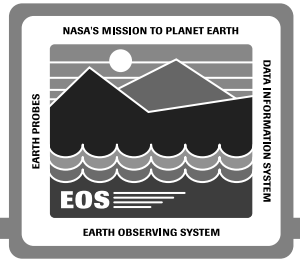
Users can reschedule an activity by:

- **Dragging resource state, or**
- **Double-clicking to bring up activity scheduler window**

Zoom in or out to show desired level of detail

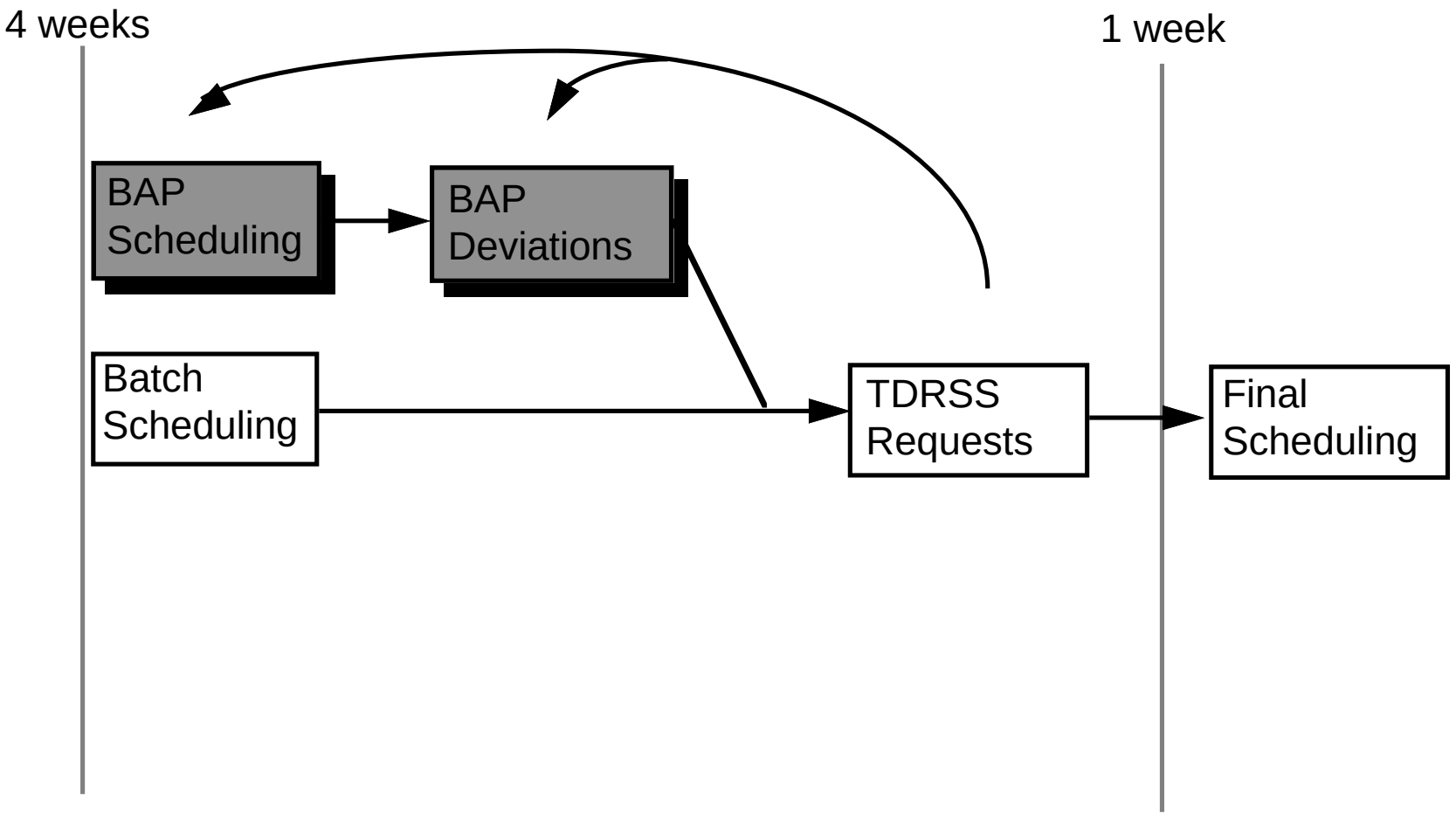
Print Timeline to any PostScript® printer (color or B&W)

Timeline Object Model

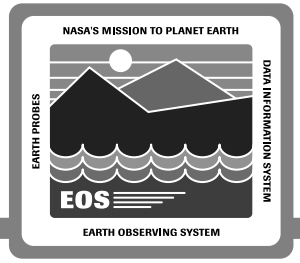


See following page.

Initial Scheduling Process



Schedule Baseline Activity Profiles



Baseline Activity Profiles used to schedule normal instrument activities

BAP's contain activities to schedule relative to trigger events

- **Trigger event is either a label activity or a normal activity**
- **Each activity within a BAP can reference a different trigger event**

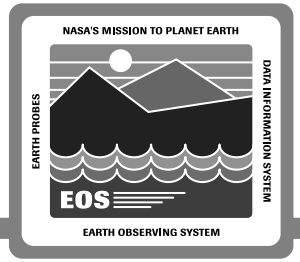
Either PI/TL or FOT schedule BAP's (coordination required)

BAP's scheduled like standalone activities, using similar screens and object models

Deviations to BAP activities scheduled using Activity Scheduler

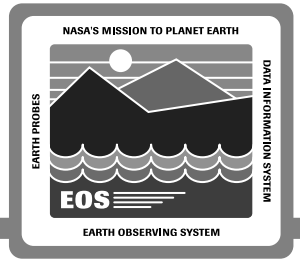
BAP's allow users to schedule normal activities quickly and easily, while still providing capability to schedule deviations

Activity Object Model



See following page.

BAP Scenario



User brings up Plan Permission Tool and specifies resource (CERES) and time interval to update

User brings up BAP Activity Scheduler Window

User selects a BAP activity

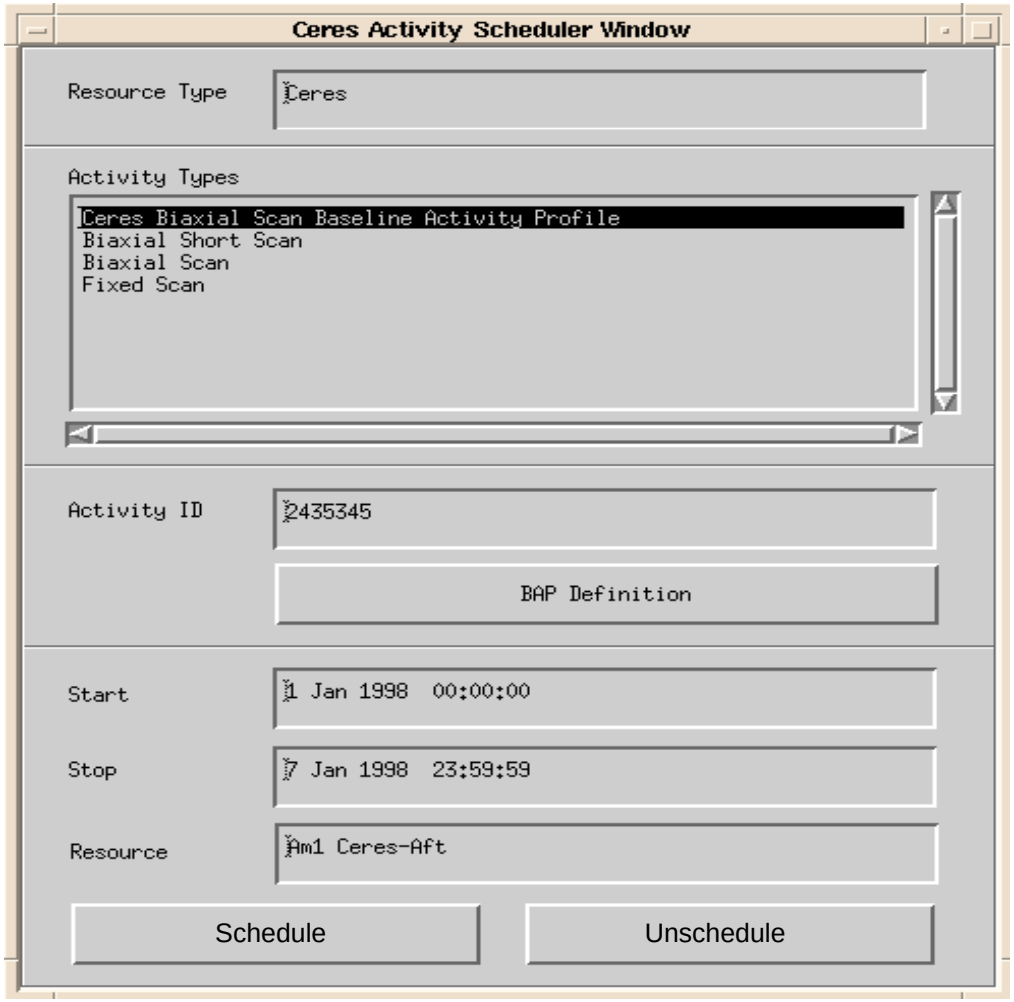
User enters a time interval to apply BAP

BAP Scheduler loops through all activities within BAP definition

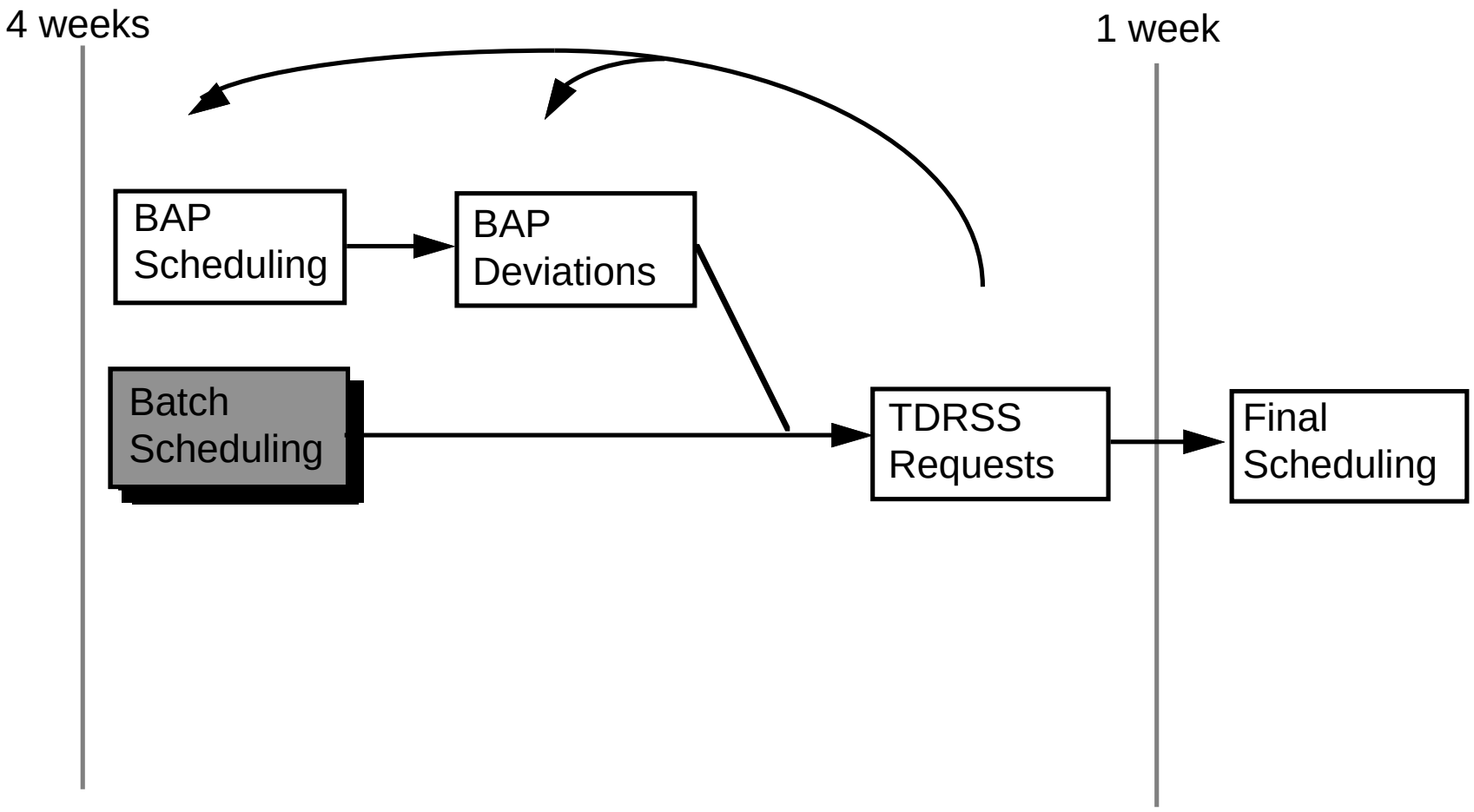
For each trigger event in time interval, corresponding BAP activity is scheduled at specified offset

User can modify or delete individual activities (deviations)

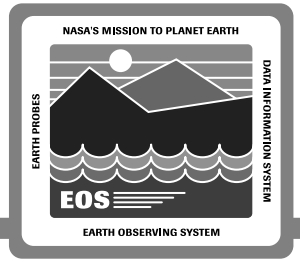
BAP Activity Scheduler



Initial Scheduling Process



Batch Scheduling



ASTER is scheduling in batch mode

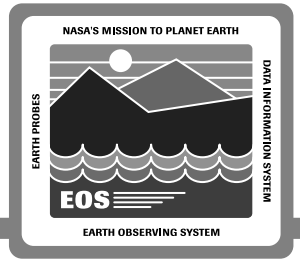
PI/TL submits activity list electronically

ASTER scheduling takes place in two phases

- **Resource Profiles scheduled during initial scheduling**
  - **Potential window of operations**
  - **Expected data volume and power requirements**
- **Activities scheduled during final scheduling**
  - **Scheduled for a specific time interval**
  - **Contain actual commands along with data and power requirements**

Resource profiles allow users to allocate shared resources early in planning cycle without specifying complete activity

ASTER Scenario



User submit ASTER resource profiles

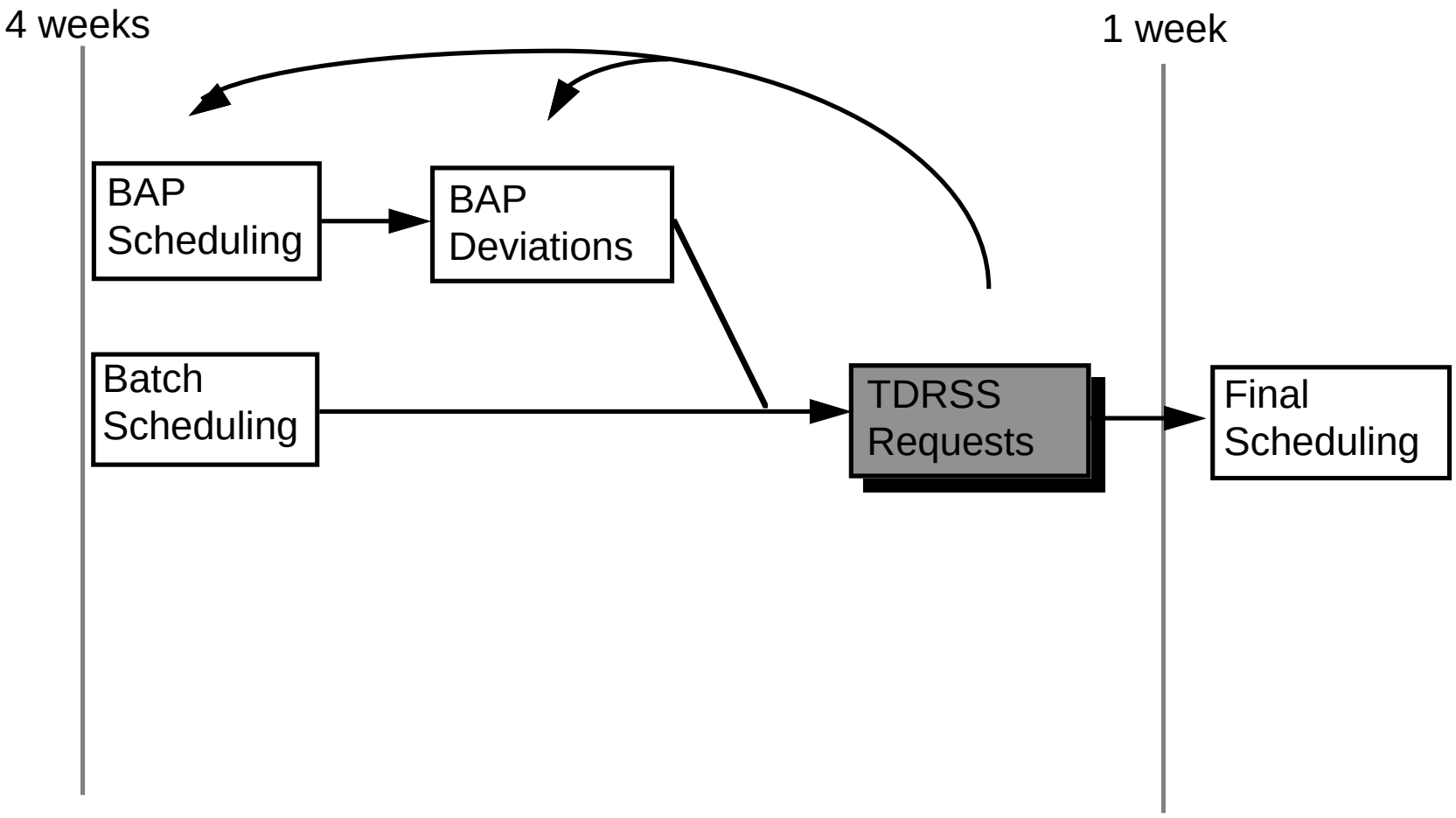
Filter reads each profile entry and adds a profile activity to mission plan

Resource Model updates resource states for ASTER, SSR buffer and power subsystem

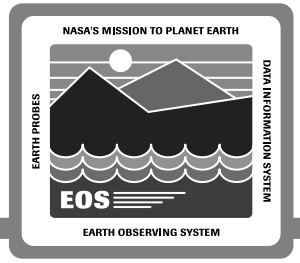
Timeline display updates to reflect new resource states

During Final scheduling, profile activities replaced by specific activities

Initial Scheduling Process



Solid State Recorder



Solid State Recorder contains multiple buffers

Buffers dedicated to a single instrument or shared

- **On AM-1 all buffers dedicated**

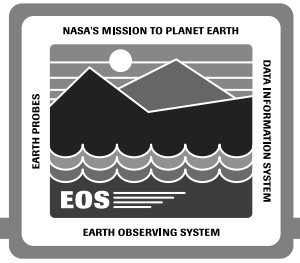
Resource Model maintains data volume in each buffer over time

- **Oversubscription of SSR buffers allowed**
- **Based on predicted usage of all scheduled activities**
- **Most activities have data volume requirements**

TDRSS contacts scheduled to minimize risk of data loss

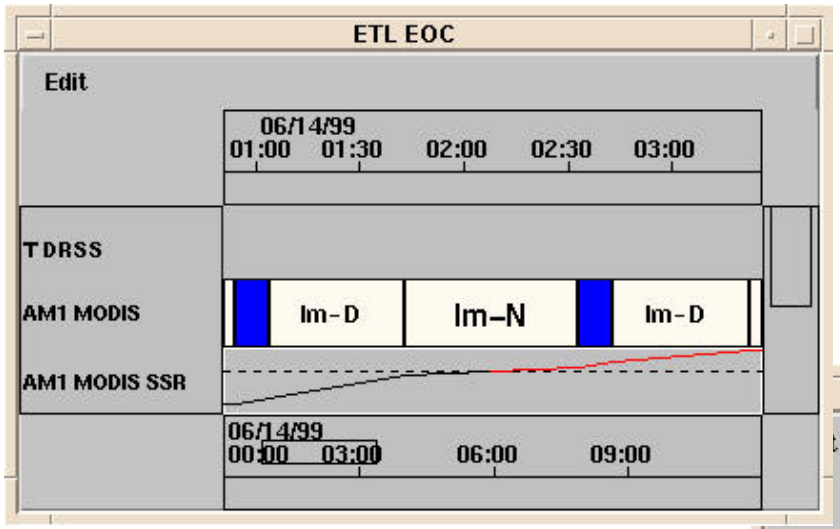
No data loss should occur during normal operations

Object Model Showing SSR

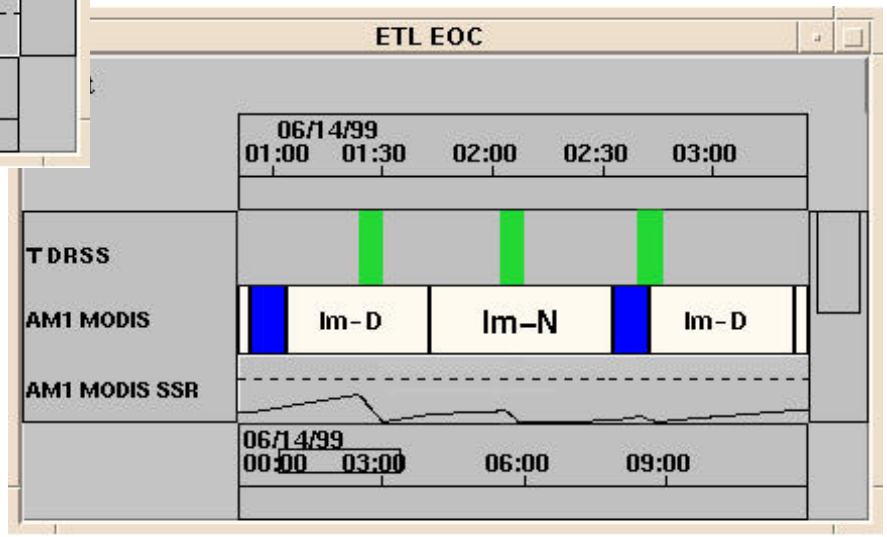


See following page.

SSR Buffers Before & After TDRSS Scheduling

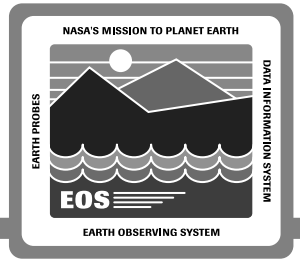


MODIS SSR Buffer before TDRSS Contact Scheduling



MODIS SSR Buffer after TDRSS Contact Scheduling

TDRSS Contact Scheduling



Activity Scheduler provides user interface for generating TDRSS requests

Scheduling algorithm computes desired TDRSS contacts

- **Select from TDRSS availability periods supplied by FDF**
- **Based upon two 10 minute TDRSS contacts per orbit**
- **Function of data volume requirements on SSR buffers**
- **Constrained by High Gain Antenna slew rates**

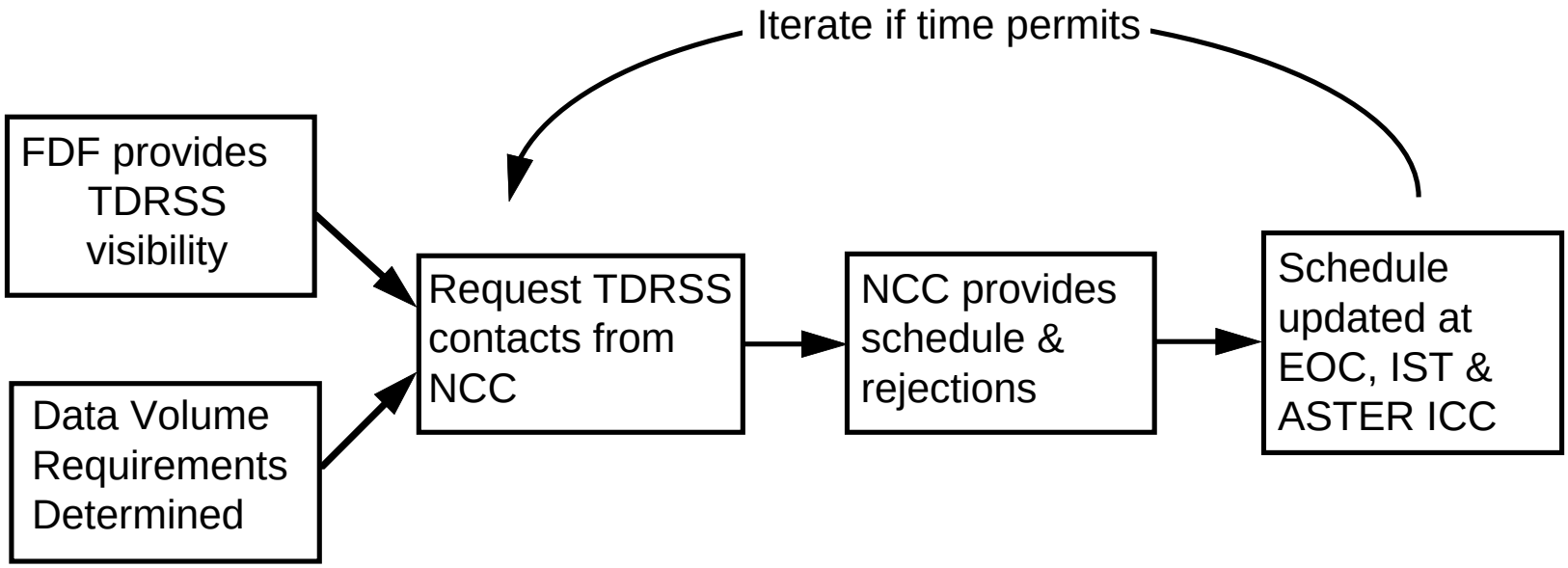
Requests manually rescheduled using Activity Scheduler

EOC request desired TDRSS contacts from NCC using electronic interface with UPS

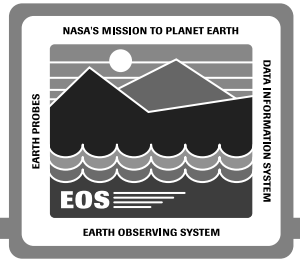
Newly received TDRSS schedules and rejections automatically incorporated by an Activity Filter

- **TDRSS contacts made part of mission schedule**
- **Viewed at either EOC or IST's**

TDRSS Scheduling Process

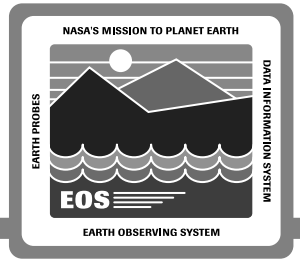


TDRSS Resource Object Model



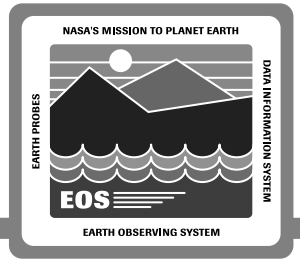
See following page.

TDRSS Activity Object Model



See following page.

TDRSS Scenario



User at EOC brings up TDRSS Activity Scheduler Display

User selects start/stop times and selects “Compute Requests”

Algorithm chooses TDRSS contact requests over specified interval

TDRSS contact requests added to mission plan

- **SSR resource states updated**
- **Timeline display updates to reflect state change**

User can manually modify TDRSS contact requests

- **Change start/stop times via timeline or activity scheduler**

User submits TDRSS contact request to NCC using UPS electronic interface

Actual TDRSS contacts reflected on mission plan once received from NCC

TDRSS Activity Scheduler